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09/904,659	07/16/2001	Sandeep Oswal	TI-32079/TXN-009	6193
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TEXAS INSTRUMENTS INCORPORATED			FAN, CHIEH M	
P O BOX 655474, M/S 3999			ART UNIT	
DALLAS, TX 75265			PAPER NUMBER	

2634

DATE MAILED: 01/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/904,659

Applicant(s)

OSWAL ET AL.

Examiner

Chieh M Fan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 7/16/01 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2/25/02</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Drawings***

1. The hand-drawn drawings filed with the application on 7/16/01 are not of sufficient quality for a reader to view. For example, it is difficult to determine whether the reference number associated with the primary coil in Fig. 1 is 130 or 139. Accordingly, replacement drawing sheets in compliance with 37 CFR 1.121(d) are suggested in reply to this Office action. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action.

### ***Specification***

2. The disclosure is objected to because of the following informalities: "(DAC) 220" on the last line of page 8 should be changed to --- (ADC) 220 ---; and "Figure 4" on the last line of page 9 should be changed to --- Figure 3 ---.

Appropriate correction is required.

***Claim Objections***

3. Claims 1-7 and 11-19 are objected to because of the following informalities:

Regarding claim 1, "said analog transmit signals" in line 6 should be changed to -  
-- said analog transmit signal --- so as to be consistent with the limitation "an analog  
transmit signal" in lines 5-6.

Regarding claim 4, "said subset of windings" in line 1 should be changed to ---  
said subset of said plurality of windings ---.

Regarding claim 6, "said signal representing said data transmitted on said  
telephone line" in lines 3-4 should be changed to --- said signal of interest representing  
said data received on said telephone line ---.

Claim 7 is objected to for failing to further limit the subject matter of a previous  
claim.

Regarding claim 11, "said analog transmit signals" in line 10 should be changed  
to --- said analog transmit signal --- so as to be consistent with the limitation "an analog  
transmit signal" in lines 9-10; and "a digital receive data" in line 12 should be changed to  
--- said digital receive data ---.

Regarding claim 14, "said subset of windings" in line 1 should be changed to ---  
said subset of said plurality of windings ---.

Regarding claim 16, "said signal representing said data transmitted on said  
telephone line" in lines 3-4 should be changed to --- said signal of interest representing  
said data received on said telephone line ---.

Claim 17 is objected to for failing to further limit the subject matter of a previous claim.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 2-6, 8-10, 12-16 and 20-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 2-6, claim 2 recites that the second set of windings comprises the plurality of windings (line 2), which means the plurality of windings are within the second set of windings. However, claim 1 indicates that the second set of windings is contained in the plurality of windings, which means the second set of windings are within the plurality of windings. Therefore, the limitation recited in claim 2 conflicts with its parent claim, which renders the claim indefinite.

Regarding claims 8-10, claim 8 recites the limitation "said plurality of windings" in line 8. There is insufficient antecedent basis for this limitation in the claim.

Regarding claims 12-16, claim 12 recites that the second set of windings comprises the plurality of windings (line 2), which means the plurality of windings are within the second set of windings. However, claim 11 indicates that the second set of

windings is contained in the plurality of windings, which means the second set of windings are within the plurality of windings. Therefore, the limitation recited in claim 12 conflicts with its parent claim, which renders the claim indefinite.

Regarding claims 20-22, claim 8 recites the limitation "said plurality of windings" in line 8. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prat et al. (U.S. Patent No. 6,804,349, "Prat" hereinafter) in view of Sharper et al. (U.S. Patent No. 6,141,377).

Regarding claim 1, Prat teaches a modem (5, 7 in Fig. 1) for receiving and transmitting data on a telephone line (1 in Fig. 1), said modem comprising: a transformer (50 in Fig. 9) having a primary coil (51, 52, 53 in Fig. 9) and a secondary coil (9 in Fig. 9), said primary coil having a plurality of windings (51, 52, 53 in Fig. 9), said secondary coil being connected to said telephone line; and a coder-decoder (CODEC) transmitting an analog transmit signal using a first set of windings (51 in Fig.

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9), said CODEC receiving an analog receive signal on a second set of windings (51, 52, 53 in Fig. 9), said first set of windings and said second set of windings being contained in said plurality of windings, said first set of windings (51 in Fig. 9) containing a fewer number of windings than said second set of windings (51, 52, 53 in Fig. 9). Prat also teaches that the modem is connected to a digital equipment, such as a microcomputer (6 in Fig. 1, col. 1, line 33). Prat further teaches the modem is intended for a high-speed data transmission of ADSL type (col. 11, lines 47-48).

Prat does not specifically show that the CODEC comprises a digital-to-analog converter (DAC) to convert a digital transmit signal to the analog transmit signal and an analog-to-digital converter (ADC) to convert the analog receive signal to a digital receive signal. Sharper teaches an ADSL modem comprises a DAC (132 in Fig. 3 or 214 in Fig. 4) and an ADC (140 in Fig. 3 or 226 in Fig. 4). As the modem of Prat is connected to a digital computer (6 in Fig. 1), it is clear the signal originated from or received by the computer are digital. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to couple a DAC to the transmission head (12 in Fig. 5 or TX<sup>+</sup>-TX<sup>-</sup> in Fig. 9) and couple an ADC to the reception head (14 in Fig. 5 or E<sup>+</sup>-E<sup>-</sup> in Fig. 9), so as to facilitate digital processing of the receive signal and analog transmission of the transmit signal.

Regarding claim 2, Prat also teaches that the second set of windings (51, 52, 53 in Fig. 9) consists of the plurality of windings (51, 52, 53 in Fig. 9) and said first set of windings (51 in Fig. 9) comprises a subset of said plurality of windings.

Regarding claim 3, Prat in view of Sharper further teaches a digital signal processor (DSP) (142 in Fig. 3 or 228 in Fig. 4 of Shaper; it is also inherent the digital computer of Prat comprises a DSP) performing signal processing operation on said digital receive data to recover the data encoded on a signal received on said telephone line.

Regarding claim 4, Prat also teaches that the CODEC comprises: a network (20 in Fig. 5 or 24-35 in Fig. 9) transmitting said analog transmit signal using said subset of windings (51 in Fig. 9), said network generating a subtraction component (output of 21 in Fig. 5) representing an echo voltage generated by transmitting said analog transmit signal; an echo cancellation unit (23 in Fig. 5) receiving said analog receive signal present on said plurality of windings and subtracting said subtraction component from said analog receive signal to generate a signal of interest representing data received on said telephone line (col. 2, lines 51-54, col. 6, lines 41-48). Also note that Prat in view of Sharper also teaches the claimed ADC and DAC as explained above in claim 1.

Regarding claim 5, the network (20 in Fig. 5 or 24-35 in Fig. 9) comprises a plurality of impedances (24-27, 30 in Fig. 9), wherein said subtraction component is measured across one of said plurality of impedances (30 in Fig. 9, col. 10, lines 8-13).

Regarding claim 6, the echo cancellation unit comprises a differential amplifier and a plurality of resistors (R in Fig. 9), wherein said differential amplifier (23, 14 in Fig. 5) subtracts said subtraction component from said analog receive signal to generate said signal representing said data transmitted on said telephone line.



Regarding claim 7, as shown in Fig. 9 of Prat, the plurality of windings (51, 52, 53 in Fig. 9) comprise all windings present in the primary coil (51, 52, 53 in Fig. 9).

Regarding claim 8, Prat teaches a modem (5, 7 in Fig. 1) for receiving and transmitting data on a telephone line (1 in Fig. 1), said modem comprising: means for transmitting an analog transmit signal using a first set of windings (51 in Fig. 9) of a primary coil (51, 52, 53 in Fig. 9) of a transformer (50 in Fig. 9); and means for receiving an analog receive signal using a second set of windings (51, 52, 53 in Fig. 9) of said primary coil, wherein said first set of windings (51 in Fig. 9) and said second set of windings (51, 52, 53 in Fig. 9) are contained in a plurality of windings of the transformer, said first set of windings containing a fewer number of windings than said second set of windings (the number of windings in 51 is fewer than that in 51+52+53). Prat also teaches that the modem is connected to a digital equipment, such as a microcomputer (6 in Fig. 1, col. 1, line 33). Prat further teaches the modem is intended for a high-speed data transmission of ADSL type (col. 11, lines 47-48).

Prat does not specifically show means for converting a digital transmit data to the analog transmit signal. Sharper teaches an ADSL modem comprises a DAC (132 in Fig. 3 or 214 in Fig. 4) and an ADC (140 in Fig. 3 or 226 in Fig. 4). As the modem of Prat is connected to a digital computer (6 in Fig. 1), it is clear the signal originated from or received by the computer are digital. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to couple the means for converting a digital transmit data to the analog transmit signal to the

transmission head (12 in Fig. 5 or TX<sup>+</sup>-TX<sup>-</sup> in Fig. 9), so as to facilitate analog transmission of the transmit signal.

Regarding claim 9, Prat further teaches means for generating a subtraction component (output of 21 in Fig. 5) representing an echo voltage generated by said transmitting; and means for subtracting (23 in Fig. 5) said subtraction component from said analog receive signal to generate a signal of interest representing data received on said telephone line (col. 2, lines 51-54, col. 6, lines 41-48).

Regarding claim 10, Prat also teaches that the second set of windings (51, 52, 53 in Fig. 9) consists of the plurality of windings (51, 52, 53 in Fig. 9) and said first set of windings (51 in Fig. 9) comprises a subset of said plurality of windings.

Regarding claim 11, Prat teaches a system comprising:

a processor (6 in Fig. 1) sending a digital transmit data and receiving a digital receive data; and

a modem (5, 7 in Fig. 1) sending said digital transmit data on a telephone line (1 in Fig. 1), said modem generating said digital receive data based on a signal of interest received on said telephone line, said modem comprising:

a transformer (50 in Fig. 9) having a primary coil (51, 52, 53 in Fig. 9) and a secondary coil (9 in Fig. 9), said primary coil having a plurality of windings (51, 52, 53 in Fig. 9), said secondary coil being connected to said telephone line; and a coder-decoder (CODEC) transmitting an analog transmit signal using a first set of windings (51 in Fig. 9), said CODEC receiving an analog receive signal on a second set of windings (51, 52, 53 in Fig. 9), said first set of windings and said second set of

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windings being contained in said plurality of windings, said first set of windings (51 in Fig. 9) containing a fewer number of windings than said second set of windings (51, 52, 53 in Fig. 9). Prat further teaches the modem is intended for a high-speed data transmission of ADSL type (col. 11, lines 47-48).

Prat does not specifically show that the CODEC comprises a digital-to-analog converter (DAC) to convert a digital transmit signal to the analog transmit signal and an analog-to-digital converter (ADC) to convert the analog receive signal to a digital receive signal. Sharper teaches an ADSL modem comprises a DAC (132 in Fig. 3 or 214 in Fig. 4) and an ADC (140 in Fig. 3 or 226 in Fig. 4). As the modem of Prat is connected to a digital computer (6 in Fig. 1), it is clear the signal originated from or received by the computer are digital. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to couple a DAC to the transmission head (12 in Fig. 5 or TX<sup>+</sup>-TX<sup>-</sup> in Fig. 9) and couple an ADC to the reception head (14 in Fig. 5 or E<sup>+</sup>-E<sup>-</sup> in Fig. 9), so as to facilitate digital processing of the receive signal and analog transmission of the transmit signal.

Regarding claim 12, Prat also teaches that the second set of windings (51, 52, 53 in Fig. 9) consists of the plurality of windings (51, 52, 53 in Fig. 9) and said first set of windings (51 in Fig. 9) comprises a subset of said plurality of windings.

Regarding claim 13, Prat in view of Sharper further teaches a digital signal processor (DSP) (142 in Fig. 3 or 228 in Fig. 4 of Sharper, it is also inherent the digital computer of Prat comprises a DSP) performing signal processing operation on said

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digital receive data to recover the data encoded on a signal received on said telephone line.

Regarding claim 14, Prat also teaches that the CODEC comprises: a network (20 in Fig. 5 or 24-35 in Fig. 9) transmitting said analog transmit signal using said subset of windings (51 in Fig. 9), said network generating a subtraction component (output of 21 in Fig. 5) representing an echo voltage generated by transmitting said analog transmit signal; an echo cancellation unit (23 in Fig. 5) receiving said analog receive signal present on said plurality of windings and subtracting said subtraction component from said analog receive signal to generate a signal of interest representing data received on said telephone line (col. 2, lines 51-54, col. 6, lines 41-48). Also note that Prat in view of Sharper also teaches the claimed ADC and DAC as explained above in claim 11.

Regarding claim 15, the network (20 in Fig. 5 or 24-35 in Fig. 9) comprises a plurality of impedances (24-27, 30 in Fig. 9), wherein said subtraction component is measured across one of said plurality of impedances (30 in Fig. 9, col. 10, lines 8-13).

Regarding claim 16, the echo cancellation unit comprises a differential amplifier and a plurality of resistors (R in Fig. 9), wherein said differential amplifier (23, 14 in Fig. 5) subtracts said subtraction component from said analog receive signal to generate said signal representing said data transmitted on said telephone line.

Regarding claim 17, as shown in Fig. 9 of Prat, the plurality of windings (51, 52, 53 in Fig. 9) comprise all windings present in the primary coil (51, 52, 53 in Fig. 9).

Regarding claims 18 and 19, as explained in the rationale applied to claim 11 above, Prat teaches the modem is intended for a high-speed data transmission of ADSL type (col. 11, lines 47-48).

Regarding claim 20, Prat teaches a modem (5, 7 in Fig. 1) performs a method for receiving and transmitting data on a telephone line (1 in Fig. 1), said method comprising: transmitting an analog transmit signal using a first set of windings (51 in Fig. 9) of a primary coil (51, 52, 53 in Fig. 9) of a transformer (50 in Fig. 9); and receiving an analog receive signal using a second set of windings (51, 52, 53 in Fig. 9) of said primary coil, wherein said first set of windings (51 in Fig. 9) and said second set of windings (51, 52, 53 in Fig. 9) are contained in a plurality of windings of the transformer, said first set of windings containing a fewer number of windings than said second set of windings (the number of windings in 51 is fewer than that in 51+52+53). Prat also teaches that the modem is connected to a digital equipment, such as a microcomputer (6 in Fig. 1, col. 1, line 33). Prat further teaches the modem is intended for a high-speed data transmission of ADSL type (col. 11, lines 47-48).

Prat does not specifically teach the step of converting a digital transmit data to the analog transmit signal. Sharper teaches an ADSL modem comprises a DAC (132 in Fig. 3 or 214 in Fig. 4) and an ADC (140 in Fig. 3 or 226 in Fig. 4). As the modem of Prat is connected to a digital computer (6 in Fig. 1), it is clear the signal originated from or received by the computer are digital. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that the modem needs to perform the step converting a digital transmit data to the analog

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transmit signal before transmitting an analog transmit signal using a first set of windings, so as to facilitate analog transmission of the transmit signal.

Regarding claim 21, Prat further teaches the steps of generating a subtraction component (output of 21 in Fig. 5) representing an echo voltage generated by said transmitting; and subtracting (23 in Fig. 5) said subtraction component from said analog receive signal to generate a signal of interest representing data received on said telephone line (col. 2, lines 51-54, col. 6, lines 41-48).

Regarding claim 22, Prat also teaches that the second set of windings (51, 52, 53 in Fig. 9) consists of the plurality of windings (51, 52, 53 in Fig. 9) and said first set of windings (51 in Fig. 9) comprises a subset of said plurality of windings.

### ***Conclusion***

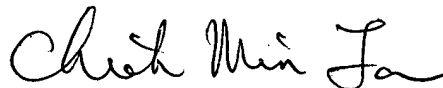
8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bagchi et al. (US2002/0057713)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chieh M Fan whose telephone number is (571) 272-3042. The examiner can normally be reached on Monday-Friday 8:00AM-5:30PM, Alternate Fridays off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571) 272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Chieh M Fan  
Primary Examiner  
Art Unit 2634

January 7, 2005